

OPERATING MANUAL



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Introduction

Read and follow the instructions contained in this operating manual.

Please read and follow all instructions in this User's Instruction Manual before attempting to operate your Material Handling Cart (E-CART) for the first time. If there is anything in this manual that you don't understand, or if you require additional assistance for setting it up. Contact factory at 26-665-7586.

Only trained, well-informed personnel, who have been instructed in accordance with this operation manual, may use or work on the stacker.

Liability or guarantee is waived if:

- The instructions in this operating manual are not observed.
- The high-lift stacking truck is operated, cleaned or maintained incorrectly.
- Alterations to the functions are carried out without the consent of manufacturer.
- Original spare parts are not used.

Safety instructions

This chapter informs the user about residual dangers relating to the correct use of the products. It contains generally valid safety instructions which must be observed.

Safety instructions relating to specific actions or situations are listed prior to the respective action and/or description of the situation in the chapter.

Principles

This product complies with state-of-the-art technical standards and recognized safety regulations, but there are still dangers which may occur which must be considered.

Only operate the product in a perfect condition and observing the information contained in the operating manual.

The operator is responsible for integrating the product with as little risk as possible into his working environment. This obligation continues through every phase of the products lifespan, beginning at the planning stage. Residual dangers are to be minimized.

Only trained, competent personnel who have been instructed using the operating manual and the product are permitted to work with the truck.

The operating manual must be understood (responsibility, checking)

Specification

Model Number		E-CART-350	E-CART-350-2
Total Capacity		750 lbs.	750 lbs.
Top shelf total capacity		0	200 lbs.
Platform Size		26 x 46"	26 x 46"
Platform Height		14 ½"	14 ½"
2 nd Deck Height		0"	41"
Distance between the decks		0"	25"
Steering wheel size		3 x Ø10" (pneumatic)	3 x Ø10" (pneumatic)
Drive wheel size		2 x Ø8" (semi-pneumatic)	2 x Ø8" (semi-pneumatic)
Overall Size		52 x 26 x 45 ¼"	52 x 26 x 45 ¼"
Travel Speed	Load	2.5 m/h	2.5 m/h
	Unload	3.7 m/h	3.7 m/h
Turning Radius		23 5/8"	23 5/8"
Lift Motor		24V/350W	24V/350W
Controller		Curtis 1228-2430	Curtis 1228-2430
Battery		2x12V/95Ah	2x12V/95Ah
Battery Charger		DC 24V/6A	DC 24V/6A
Weight		280 lbs.	325 lbs.

Receiving Instructions

Every unit is thoroughly tested and inspected prior to shipment. However, it is possible that the unit may incur damage during transit. If you see damage when unloading, make a note of it on the SHIPPER RECEIVER.

Remove all packing & strapping material, inspect for damage. IF DAMAGE IS EVIDENT, FILE A CLAIM WITH THE CARRIER IMMEDIATELY! Also, check fork size, type of power unit, etc., to see that the unit is correct for the intended application.

Warnings & Safety Instructions

Insure that all employees understand and follow the following instructions

- Read and understand the owner's manual before using or servicing the stacker.
- Do not use the stacker if any damage or unusual noise is observed.
- Improper use of this lift truck could result in injury and damage to load or equipment.
- Always watch the stacker and any load on it carefully when it is being used or moved.
- DO NOT load beyond rated capacity.
- DISTRIBUTE load evenly
- Avoid sudden stops or quick turns to prevent accidental tipping of the load.
- Load must be centered and evenly distributed on the forks.
- Park the truck on level surfaces and not in the way of other products
- When parked, lower the load fork completely.
- When parked, push E-switch push-button down.
- Do not perform any modifications to the stacker without the manufacturer's approval. Failure to receive authorization for changes to the equipment could void the warranty.
- Do not use brake fluid or jack oil in the hydraulic system. If oil is needed, use an anti-wear hydraulic oil with a viscosity grade of 150 SUS at 100°F, (ISO 32 @ 40°C), or a non-synthetic transmission fluid.
- Use only replacement parts either supplied or approved by the manufacturer.

Rules For Safe Use

These symbols below are used in this owners manual to identify warnings and cautions. It is very important for to read and understand them.



Warning: Failure to note the warnings in this users manual may result in personal injury



Caution: Failure to observe the cautions in this users manual may result in damage to your E-CART.

Your E-CART is a powerful machine, for your safety and safety of the bystanders, please read all instructions in this manual before operating your E-CART, they have been prepared from years of experience with this type of equipment. Follow notes carefully to ensure safety at all times.

Always make certain your machine is in full working order before your operation.

1. Do not operate E-CART without reading this instruction manual. Also read all of the safety instructions and warnings stated in this manual.
2. Do not exceed the maximum safe gradient outlined for your vehicle.
3. Do not carry passengers or exceed the maximum carrying weight.
4. Do not turn suddenly at full speed, especially on uneven or sloping ground.
5. Avoid climbing or descending curbs, you may permanently damage E-CART.
6. Always stop fully before changing direction (forward or reverse)
7. Always avoid uneven surfaces.

SAFETY INSTRUCTIONS AND WARNINGS

WARNING: Don't attempt to operate E-CART for the first time without completely reading and understanding all of the facts in this instruction manual.

When you begin to use E-CART, you will probably encounter situations in which you will need some practice. Simply take your time and practice to control as you maneuver through the doorways, on and off elevators, up and down ramps and over moderate terrain.

SAFETY CHECK

Get to know the feel of your E-CART and its capabilities. Factory recommends that you perform a safety check before each use to make sure that E-CART operates smoothly and safe. For details on how to perform these necessary inspections, see the care and maintenance section of this manual. Perform following inspection prior to using your E-CART.

- Check all battery connections, make sure they are serviceable and not corroded.
- Check batteries if they are fully charged.
- Check operation of brakes.
- Before leaving the cart, make sure turn off the power.

Warning: Don't carry people on the E-CART, this may cause in personal injury and/or property damage.

WEIGHT LIMIT

E-CART is designed for a maximum user weight limit of 750 lbs. (340 kgs.)

Warning: Exceeding the weight limit will void your warranty and may result in personal injury and damage to E-CART. Vestil will not be held responsible for injuries and/or property damage resulting from failure to observe these weight limitations.

Excessive high cornering speeds can create the possibility of cargo tipping. Factors which affect the possibility of cargo tipping include, but are not limited to, cornering speed, uneven surfaces, inclined surfaces, and abrupt directional changes. Don't corner at high speed! If you feel that your cargo may tip over on a corner, reduce your speed and steering angle to prevent your cargo from tipping.

OUTDOOR DRIVING SURFACES

- Reduce speed when operating on uneven terrain or soft surfaces.
- Avoid long and unsafe grass that can tangle in the running gear or may hide debris and holes.
- Avoid loosely packed sand and gravel.

INCLINES

- When descending an incline keep your speed adjustment set to the slowest speed setting to ensure a safely controlled descent and drive in forward direction only.

Warning: Never drive down an incline at full speed.

- When climbing an incline, try to keep your E-CART moving, if you must stop, start

up again slowly and then accelerate smoothly with caution. Avoid sudden stops, lean forward towards your handlebars to increase stability.
 Warning: Any attempt to climb or descend an incline steeper than shown below may put your E-CART in an unstable position and cause it to tip, resulting in personal injury.



SYMBOLS & PICTURES

In addition to the text and illustrations, this operating manual contains various symbols which should draw attention to the safety requirements.





They generally have the following appearance:

Signal wording	Explanation
DANGER	Warning of an imminent danger! Non-observance cause death or serious injury
WARNING	Warning of a possibly incoming dangerous situation. Non-observance may cause death or serious injury.
CAUTION	Warning of a possibly incoming dangerous situation. May also be used for warnings of major damage to property.

Other definitions:

DIRECTION	Marks recommendations for use and other useful information. Does not warn of dangerous situations.
IMPORTANT	Warns of a harmful situation. Non-observance may cause damage to material.


USE SYMBOLS & PICTURES

	Possible danger to file and limb or machine!		Do not reach into running motor!
	Danger of crushing!		Wear safety shoes

Product description

Designated use

- ❖ The CART is to be used on hard level surfaces.
 - To move the stacker between buildings, warehouses etc
 - The gradient of the slope must not be more than 10%
 - Make sure load is not loose or unstable.
 - Do not pick up loads on tips or forks or edge of platform.
 - Do not overload.
 - The road surfacing must be solid and have a good grip.
- ❖ Travel routes must offer sufficient load-bearing capacity for the loaded CART.
- ❖ The CART is not suitable for continuous use in cool-houses!

Ambient conditions				
Temperature	From To	14 113	°F °F	
Degree of humidity		≤70	%	
Permitted floor incline				
• Loaded		Max. 0.5	%	
• Unloaded ¹		Max. 2.0	%	

OPERATION

Visually inspect E-CART for damaged and worn parts, before Electric Cart is taken into operation. Authorized person should read and understand all instructions



Caution!

Pedestrian controlled industrial trucks may only be operated by persons who have been satisfactorily instructed in operating the truck and have proved their ability to operate the truck to the responsible representative of the operating company.

The first driving attempts should take place on level and spacious surfaces.

Recommendation:

The operator who is to maneuver the CART should be allowed to practice, when unloaded, until they can safely operate these functions.

Travel

The butterfly switch controls the direction and speed of the lift truck. Rotating the butterfly control towards the forks moves the truck in the forward direction. Rotating the butterfly control away from the forks, moves the truck in the reverse direction. The control is progressive – the further you rotate the control, the faster the truck will travel.



DIRECTIONAL SPEED CONTROL THROTTLE

Emergency reverse safety button

At the top of the handle is a red safety reverse button. The button is designed to change the travel direction away from the operator when depressed. The truck will stop moving away from the operator when the button is released. When the fork truck is traveling forward (away from the operator) the button has no effect when activated.

If the belly switch becomes jammed or stuck, it will move forward (away from the operator) for a maximum of 3 seconds at which time the control circuit will become disabled until the handle is re-set to the full up or full down position and the belly switch is returned to normal operation.

BELLY SWITCH (SAFETY REVERSE BUTTON)

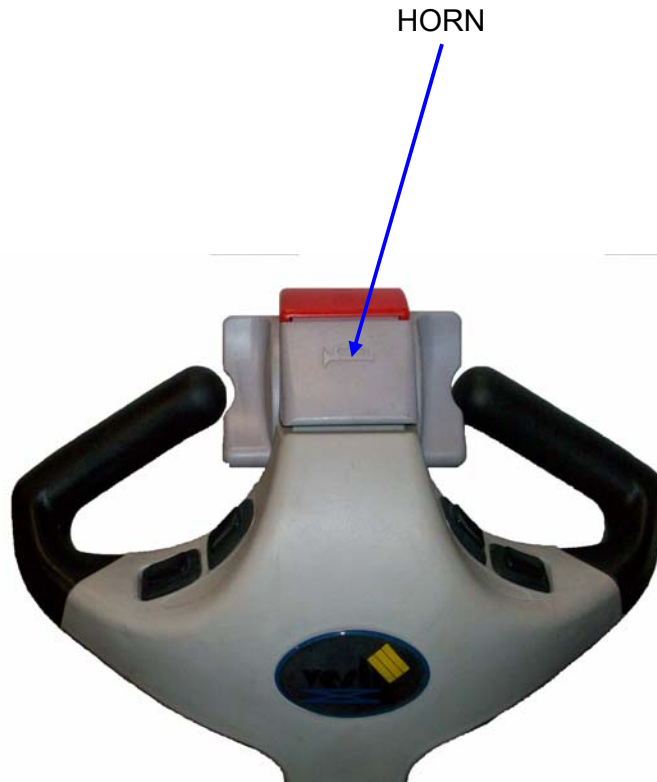


TO BRAKE

This cart is equipped with a brake that is applied between 1~5 degrees of the vertical position . When you release your hand from the handle. It will resume the neutral position automatically, as the brake in work. Always make sure that the brake is in work before operating the cart .

HORN

A horn is located on the front side of the handle.



Maintenance and repair

TROUBLESHOOTING GUIDE --

Warning: Before performing any task, always block drive wheel off of the ground.
 Consult the factory for problems at time of installation, or for any problems not addressed below.

<u>Problem:</u>	<u>Possible cause(s):</u>	<u>Action:</u>
Unit doesn't move when controls are used.	Battery voltage low (<17) Problem with motor controller (check for LED flash code on side of controller) Fuse blown	Charge batteries. Consult diagnostics page/factory Remove back shroud and check fuses (3 fuses).
Unit will not charge	Charger malfunction Bad batteries	Verify output voltage on charger, will only get a reading when connected to batteries; should be approximately 28 volts. Load test batteries
Unit will not go forward; reverse works; belly switch just kills unit (does not go forward and time out)	Broken wire, or loose connection Contactor bad, motor controller bad	Locate Pin 2 on Molex connector at motor controller. Trace wiring to contactor and verify connection. When forward is depressed, there should be 24 volts on this wire from Molex connector to the contactor, if not, the motor controller may be bad; consult diagnostics page/factory. If 24 volts is present at contactor, verify ground connection. If ground is good, remove both wires and check with ohm meter; resistance should be approximately 38 ohms. If it's open or zero, the contactor should be replaced.
Unit will not go reverse; belly switch works (i.e. when the handle is in operating range and rotating throttle in reverse and the belly switch is hit, the unit moves forward and times out)	Broken wire, or loose connection, contactor bad, motor controller bad	Same as above; except locate Pin 3 on Molex connector on motor controller...and follow procedure.

E-CART (ELECTRIC CART)

<u>Problem:</u>	<u>Possible cause(s):</u>	<u>Action:</u>
<p>Unit will not go forward, or reverse, but belly switch still functions properly.</p>	<p>Broken wire, or loose connection, bad motor controller,</p> <p>Throttle assembly bad</p>	<p>Locate Pin 6 on Molex connector at the motor controller. Try to drive the unit in forward, there should be 0 to 5 volts (5v is full throttle) at this pin. If there is voltage and the unit does not move, the motor controller may be bad, consult diagnostics page/factory. If there is no voltage, trace the wiring back towards the tiller head and check voltage on each side of connectors. Continue this until bad connection is found.</p> <p>If the connections are all good, and there is no voltage coming out of throttle assembly, then the throttle assembly may be bad. Verify there is 24 volts going into the assembly and that there is a good ground. If there is still no output voltage for pin 6, replace throttle assembly. See Fig. 1</p>
<p>Unit will not move forward, or reverse, and the Belly switch will not function, unit does turn on as indicated by the battery gage lighting up.</p>	<p>Blown fuse</p> <p>Broken wire, or loose connection</p>	<p>Verify fuses are good, replace if blown.</p> <p>Locate Pin 7 on Molex connector at the motor controller. Trace wire back up to tiller head and verify continuity all the way to the throttle assembly. Repair any loose connections.</p> <p>If there is continuity up to the throttle assembly, then check the ground wire that comes off of B- on the motor controller (3rd terminal down). Add more length to this wire if necessary, and re-terminate with a ring terminal.</p>

E-CART (ELECTRIC CART)

<p>Unit will not go forward; the belly switch functions; reverse works.</p>	<p>Broken wire, or loose connection, bad motor controller</p> <p>Bad throttle assembly</p>	<p>Locate Pin 11 on Molex connector at the motor controller. Try to drive the unit in forward; there should be 24 volts at this pin. If there is voltage and the unit does not move, the motor controller may be bad, consult diagnostics page/factory. If there is no voltage, trace the wiring back towards the tiller head and check voltage on each side of connectors. Continue this until bad connection is found.</p> <p>If the connections are all good, and there is no voltage coming out of throttle assembly, then the throttle assembly may be bad. Verify there is 24 volts going into the assembly and that there is a good ground. If there is still no output voltage for pin 11, replace throttle assembly. See Fig. 1</p>
<p>Unit will not reverse; belly switch does not function; forward ok</p>	<p>Broken wire, or loose connection, bad motor controller</p> <p>Bad throttle assembly</p>	<p>Locate Pin 12 on Molex connector at the motor controller. Try to drive the unit in reverse; there should be 24 volts at this pin. If there is voltage and the unit does not move, the motor controller may be bad, consult diagnostics page/factory. If there is no voltage, trace the wiring back towards the tiller head and check voltage on each side of connectors. Continue this until bad connection is found.</p> <p>If the connections are all good, and there is no voltage coming out of throttle assembly, then the throttle assembly may be bad. Verify there is 24 volts going into the assembly and that there is a good ground. If there is still no output voltage for pin 12, replace throttle assembly. See Fig. 1</p>
<p>Belly switch does not function; forward ok; reverse ok</p>	<p>Broken wire, or loose connection, bad motor controller</p> <p>Bad belly switch</p>	<p>Locate Pin 13 on Molex connector at the motor controller. Try to drive the unit in reverse, and hit the belly switch... there should be 24 volts at this pin. If there is voltage and the unit does not move, the motor controller may be bad, consult diagnostics page/factory. If there is no voltage, trace the wiring back towards the tiller head and check voltage, or continuity on each side of connectors. Continue this until bad connection is found.</p> <p>If the connections are all good, and there is no voltage, then the switch may be bad. Verify there is 24 volts going into the switch.</p>

E-CART (ELECTRIC CART)

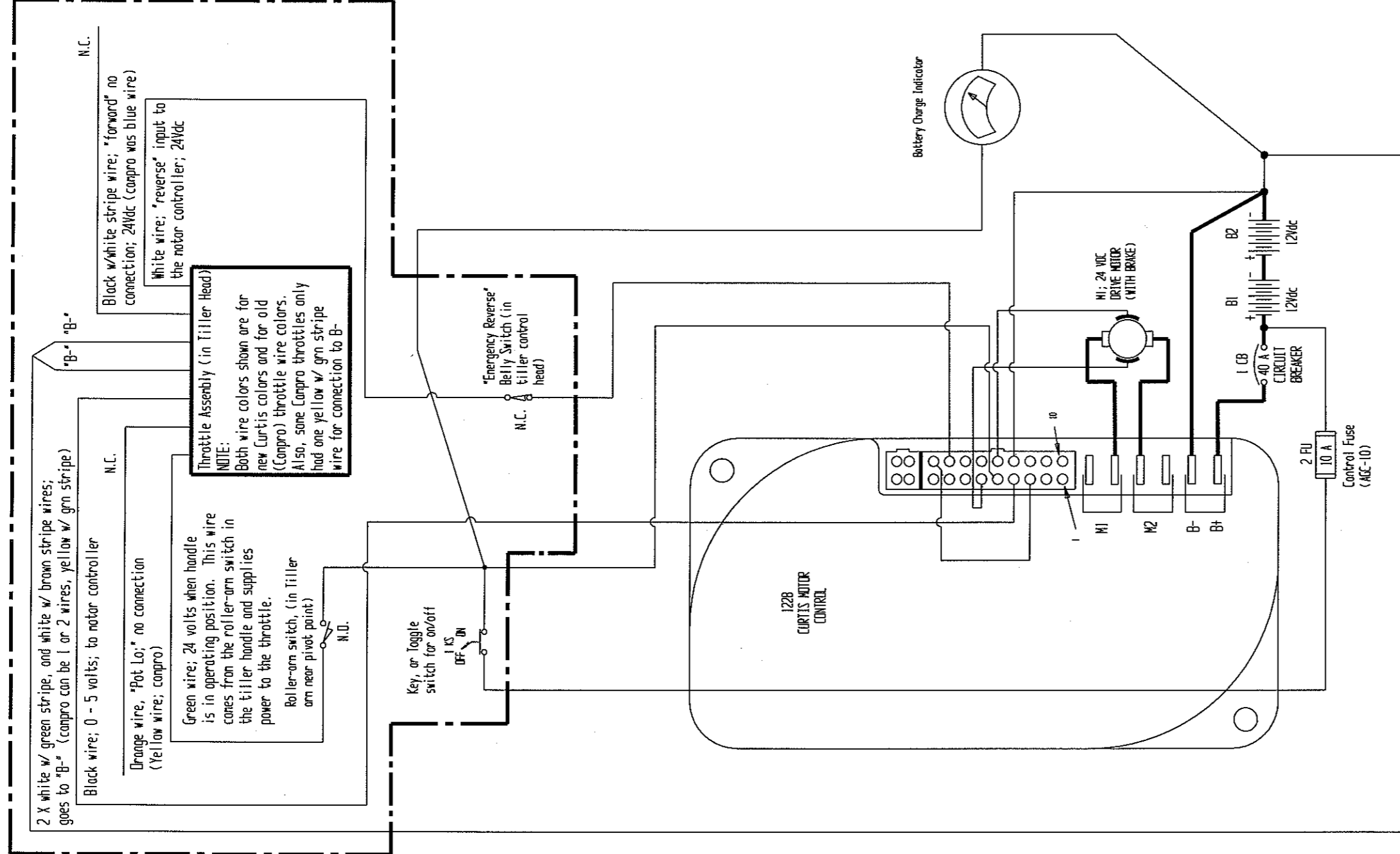
		If there is still no output voltage for pin 13, replace the switch.
Unit will not reverse. The unit only goes forward for about 1 second and dies when the handle is pulled down. When the handle is re-set and pulled down the unit will move forward again then die.	Stuck Switch	The belly switch is stuck on. Tap the orange assembly to see if the switch can be freed. If this doesn't work, disassemble the tiller head by removing 3 screws from bottom. Slightly loosen up the two screws that hold the switch in place, this may free the switch. If it is still stuck, contact the factory for a replacement switch.
Unit will not reverse; belly switch does not function; forward ok	Broken wire, or loose connection, bad throttle assembly, bad motor controller.	Locate Pin 12 on Molex connector at the motor controller. Try to drive the unit in reverse; there should be 24 volts at this pin. If there is voltage and the unit does not move, the motor controller may be bad, consult factory. If there is no voltage, trace the wiring back towards the tiller head and check voltage on each side of connectors. Continue this until bad connection is found. If the connections are all good, and there is no voltage coming out of throttle assembly, then the throttle assembly may be bad. Verify there is 24 volts going into the assembly and that there is a good ground. If there is still no output voltage for pin 12, replace throttle assembly.

Tiller Head throttle/emergency reverse wiring.

DRAWING NUMBER
16-124-020

REV.
A

REV. A	DWG #: 16-124-020	REV.	DATE	REVISIONS	INITIAL
		A	05/07/10	change AGC-5 to AGC-10	TG



Below voltage readings taken with key (toggle) switch "ON"; i.e. unit powered up.

- Pin 1: no connection
- Pin 2: no connection
- Pin 3: Jumper wire from pin 3 to pin 18
- Pin 4: pot wiper; 0 to 5 volts when throttle is rotated (in forward or reverse, with handle in operating range)
- Pin 5: Key Switch Input, 24 volts when the unit is turned "ON"
- Pin 6: Brake - (ground for brake)
- Pin 7: no connection
- Pin 8: no connection
- Pin 9: no connection
- Pin 10: no connection
- Pin 11: no connection
- Pin 12: no connection
- Pin 13: pot 10; 0 volts; pin 7 jumpered to battery minus (B-)
- Pin 14: brake output; 24 volts when brake is electrically disengaged (not mechanically with lever on motor/brake) handle in operating range and throttle is applied.
- Pin 15: no connection
- Pin 16: no connection
- Pin 17: Reverse; 24 volts when unit moving towards operator, handle in operating range. 0 volts when in forward, or when in reverse and belly switch is engaged.
- Pin 18: Jumper wire from Pin 18 to Pin 3

①	N.C.	①	SPEED POT
②	N.C.	②	REVERSE
③	N.C.	③	N.C.
④	BRAKE -	④	N.C.
⑤	ON/OFF KS	⑤	BRAKE +
⑥	POT WIPER	⑥	POT LO N.C.
⑦	POT HI	⑦	N.C.
⑧	N.C.	⑧	N.C.
⑨	N.C.	⑨	N.C.

VESTIL MANUFACTURING CO.

RELATED DOC'S.	SCALE: N/A	APPROVED BY: <i>TG</i>	DRAWN BY: TG
	DATE: 04/07/09		SIZE: B
	SCHEMATIC, ELECTRICAL, (1228), ECART		
MATERIAL: N/A	DWG. #: 16-124-020	REV: A	

TG 05/07/10

Instructions for Changing the Batteries, estimated time, 15 min.

READ ALL INSTRUCTIONS BEFORE PROCEEDING!

Only qualified personnel should work on this equipment!

Lock out all potential energy sources before attempting this installation; turn off the unit and remove the key.

Warning!

- ! Working with or near lead acid batteries is dangerous. Batteries contain sulfuric acid and produce explosive gases. A battery explosion could result in loss of eyesight or serious burns.
- ! Do not smoke or allow a spark or flame near batteries. Charge batteries in locations which are clean, dry, and well-ventilated. Do not lay tools or anything metallic on top of any battery. All repairs to a battery must be made by experienced and qualified personnel.
- ! When working with batteries, remove personal items such as rings, bracelets, necklaces, and watches. Batteries can produce enough energy to weld jewelry to metal, causing a severe burn.
- ! Always have fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- ! Operating the battery with a low battery voltage can cause premature motor contact failure.
- ! Do not expose the lift or charger to rain or adverse conditions.
- ! Replace defective cords or wires immediately.
- ! Check the battery's water level frequently if this applies to your battery type.
- ! Make sure the battery charger is unplugged from 115vac source.

Battery Charger Operating Instructions

Plug the charger into a standard 115V receptacle. If an extension cord must be used, keep it as short and as large as possible. A small cord will decrease the output of the charger due to the voltage drop in the line. This will increase the charging time. It can also cause the 115V cord to overheat.

When properly connected, the charge LED will indicate the status of charge current flowing to the battery, as follows: Power LED is always green when charger is plugged in. The status light is as follows:

Red only – the charger is providing full output to the battery.

Yellow – the charger is “topping off” the battery.

Green – the charger is providing a “float,” or maintenance, charge.

Remember to unplug the charger before moving the equipment. Failure to do so could cause damage to cords, receptacles and other equipment.

Troubleshooting:

If the unit does not operate, check all of the wiring connections to make sure they're both mechanically and electrically sound – specifically at the battery, and the motor.

A fully-charged lead acid battery in good condition at room temperature should read 12.65 volts. At 11.9 volts it is considered to be fully discharged and in need of charging. When checking battery voltage, wait at least 1\2 hour after the charger has been turned off before checking the battery's voltage.

If the batteries aren't being charged by the charger, check the output charger fuse. Verify fuse is good with an ohmmeter, or close visual (ohm meter best). Fuse is a 10Amp 250 Volt; GBD 10A. If it is good, check the battery's state of charge with a voltmeter. The charger must be connected to the battery in order to read the output voltage of the battery charger. Depending on the state of charge of the batteries, the voltage should be somewhere around 27 to 28 volts dc.

If it is determined the batteries are dead, and need replaced, change the batteries.

Tools Required:

14mm wrench, or crescent wrench

Regular flat bladed screw driver

Instructions; Changing the Motor Controller in; estimated time, 30 min.

READ ALL INSTRUCTIONS BEFORE PROCEEDING!

Only qualified personnel should work on this equipment!

Lock out all potential energy sources before attempting this installation; turn off the unit and remove the key.

Warning!

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- ! Do not smoke or allow a spark or flame near batteries. Charge batteries in locations which are clean, dry, and well-ventilated. Do not lay tools or anything metallic on top of any battery. All repairs to a battery must be made by experienced and qualified personnel.
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- ! Always have fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- ! Operating the battery with a low battery voltage can cause premature motor contact failure.
- ! Do not expose the lift or charger to rain or adverse conditions.
- ! Replace defective cords or wires immediately.
- ! Check the battery's water level frequently if this applies to your battery type.
- ! Make sure the battery charger is unplugged from 115vac source.

Troubleshooting:

If it has been determined the motor controller needs to be replaced, the following procedure can be used.

Tools Required:

2x 14mm wrench, open face

Philips head screwdriver

8mm wrench

This is the top side of the tiller. Fig1



Fig.1

This is the driver side of the tiller, looking at the belly switch. Fig 2



Fig.2

This is the bottom side of the tiller handle. 3 Allen head screws need to be removed. Fig.3



Fig.3

Lift the front top edge of the tiller cover up. Fig4



Fig.4



Fig.5

Carefully pull the belly switch back off of the tiller while tipping the front up.
Fig 6



Fig.6

The tiller assembly cover should come off, just be careful not to drop it and rip out the wiring from the connectors. At this point, the tiller throttle assembly can be replaced with a new one by just unplugging the two connectors. Or, if the problem appears to be in the belly switch itself, further breakdown of the assembly can continue to search for the problem. Fig 7



Fig.7

Unplug the two connectors from the tiller throttle assembly. Fig8

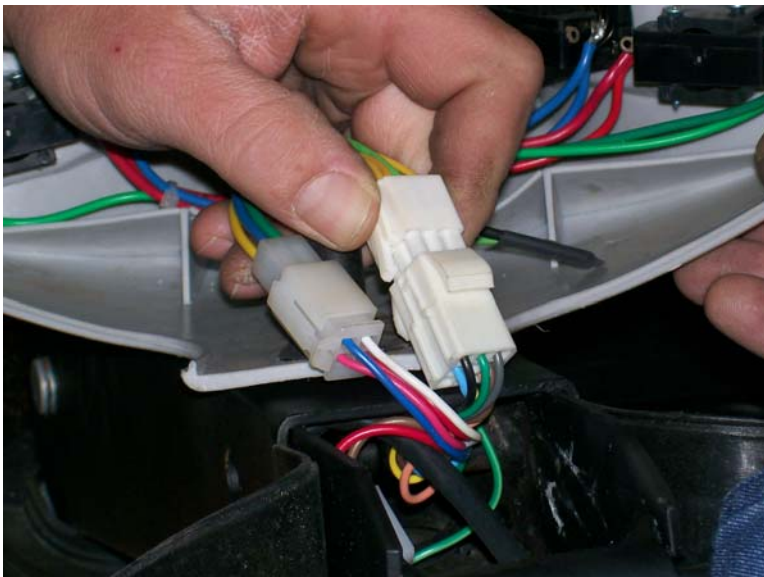


Fig.8

Remove Philips screw on throttle. Fig.9



Fig.9

Throttle wheel will then pull off. Take note of the orientation of the wheel on the shaft. Correct orientation is shown here. Fig 10



Fig.10

Do the same on the other side, taking note of the orientation of the two plastic bushings. If the throttle wheel had a tendency to stick, contact Vestil Manufacturing for replacement bushings. Fig 11

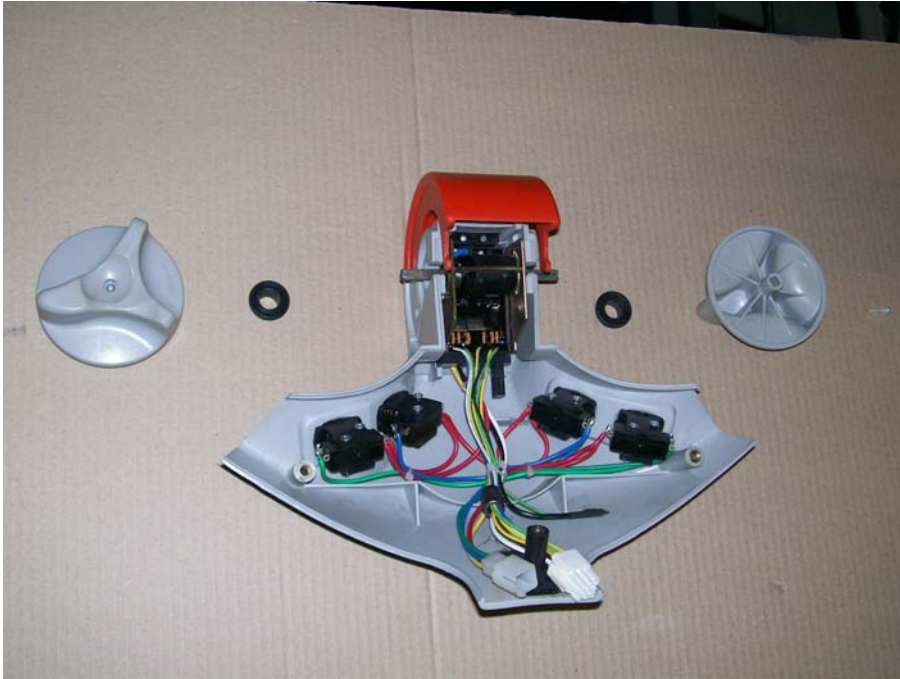


Fig.11

The front of the red cover should be connected via the gray nub. Fig 12



Fig.12

To remove the red cover, use a small screwdriver and carefully lift the plastic up over the gray nub.
Fig 13

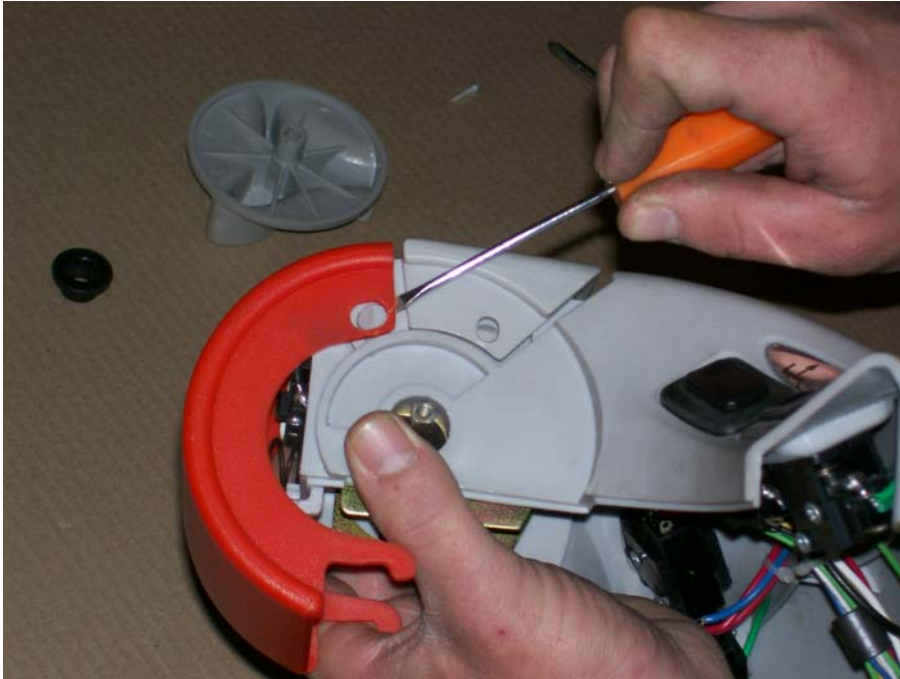


Fig.13

Do the same on the other side, and remove. Fig 14



Fig.14

Filename: Belly Switch trouble shoot

This should expose a spring. This spring has a specific orientation. When assembled the spring sets in the red cup on the inside of the red belly cover. Fig 15

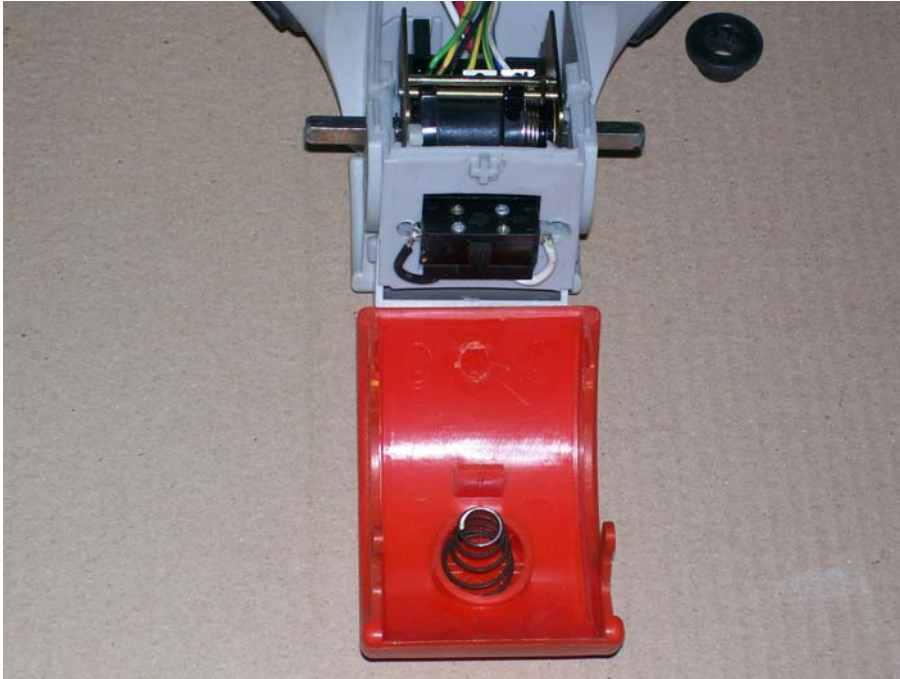


Fig.15

The other side of the spring fits over the gray plastic nub above the switch. Fig 16



Fig.16

Another picture of the nub, spring not shown. At this point, verify the solder joints are in tact and the two wires are attached to the switch as shown below. Also verify the belly switch is not stuck in. You should be able to push on the switch and the actuator will move freely in and out, you should here a click as you do this. If the switch is stuck in contact Vestil Manufacturing for replacement options. Fig17

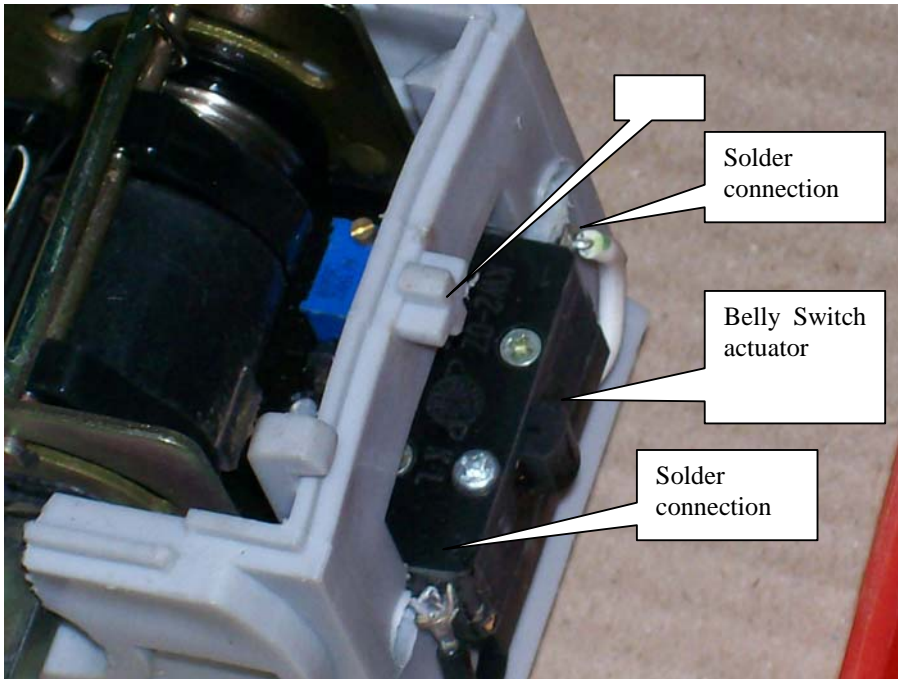


Fig.17

Replace any broken/missing components. To assemble, press the red belly switch cover back on the tiller head seating the red holes over the gray nubs. Basically the opposite of the procedure in Fig. 17, but without a screwdriver. Fig 18



Fig.18

The spring can be pushed into position.
Fig. 19



Fig.19

This is the spring shown not seated completely. Push the spring into the pocket, and over the gray plastic nub. Fig20



Fig.20

Install bushings. Fig21



Fig.21

Put throttle thumb wheels back on. Fig22



Fig.22

Install Philips screw. Fig23



Fig.23

Re-installing the tiller cover is basically reversing steps Fig 3 thru 7; with the following precautions/steps.

Make sure red tabs on each side goes on top of black nubs when installing tiller cover on the handle.

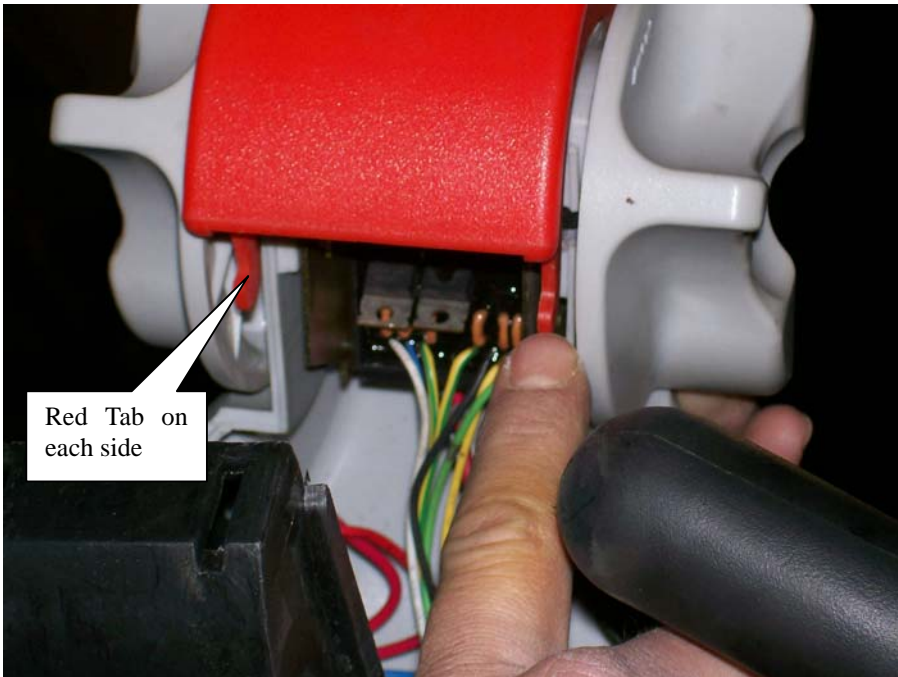


Fig.24

Black nub for right side shown here; and the next photo Fig 25

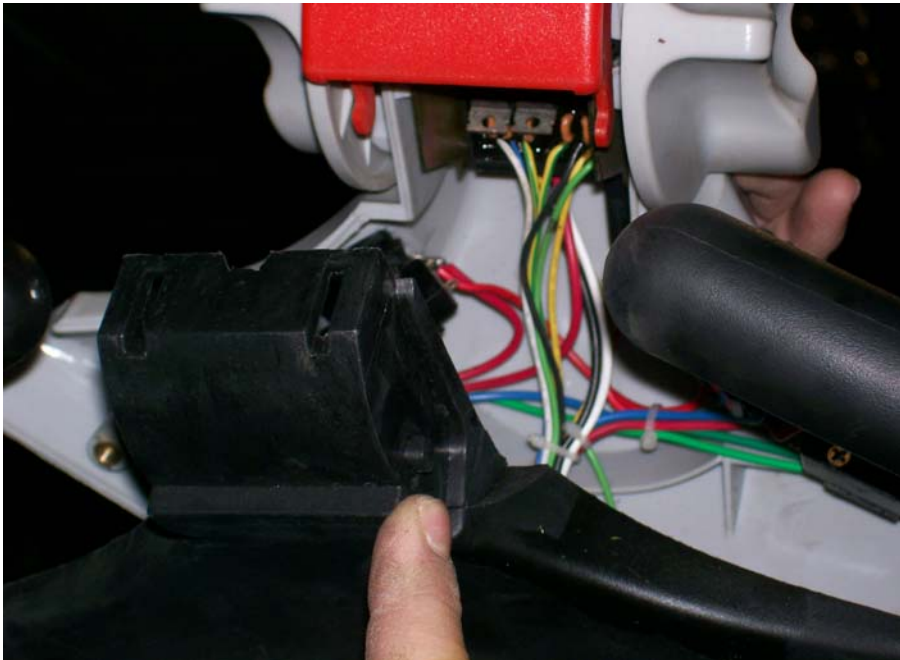


Fig.25

The red tab slides over the top of this black nub on each side when installing the tiller throttle assembly back on the handle. Fig 26

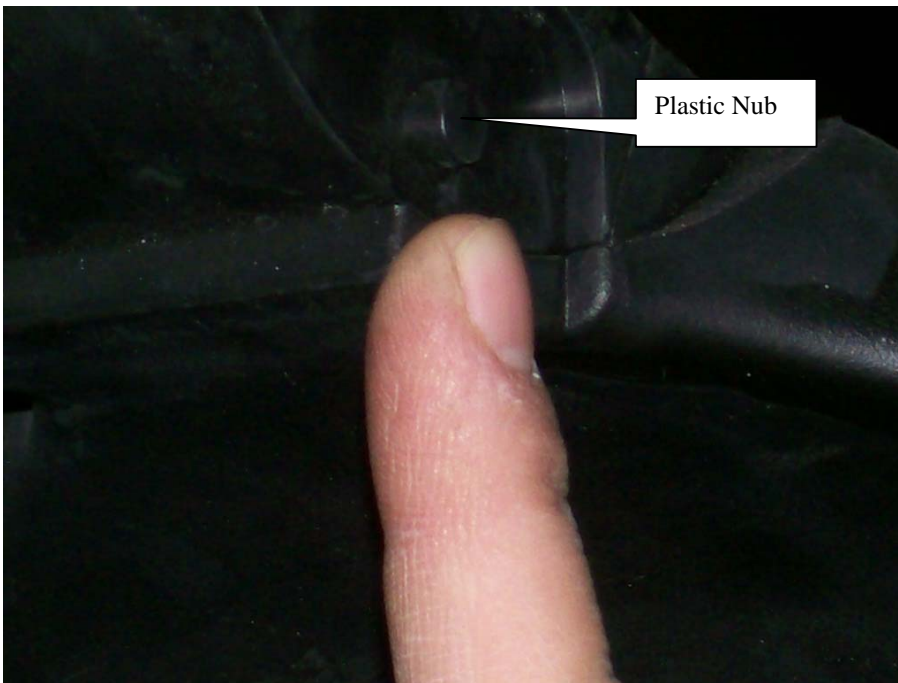


Fig.26

This shows sliding the red tabs over the black nub. This is basically the reverse of Fig6.

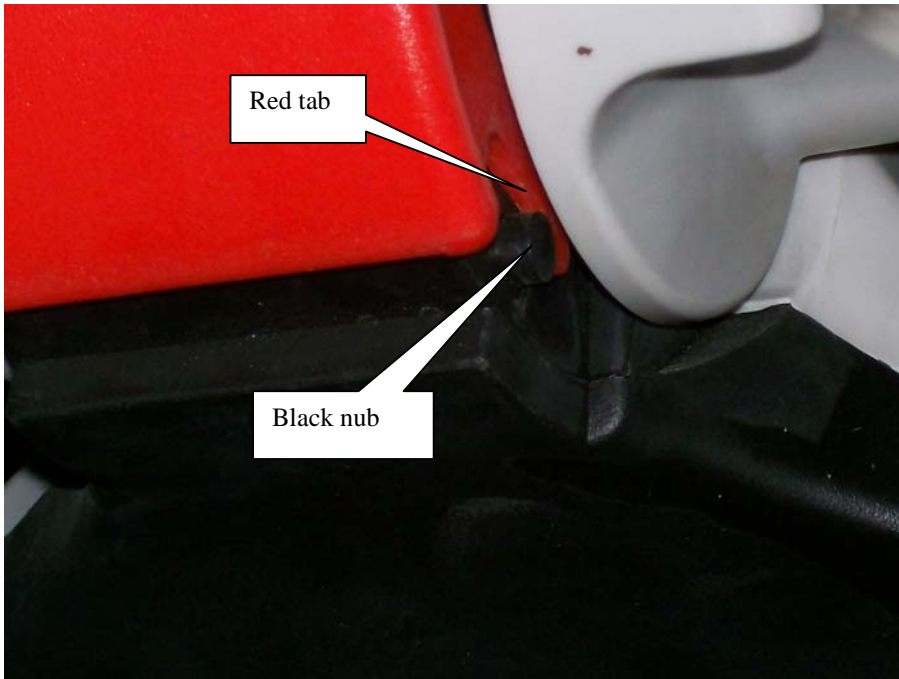


Fig.27

This is the top front where the two connectors are. Make sure they are on each side of the stand off so the wires do not get pinched. Fig28

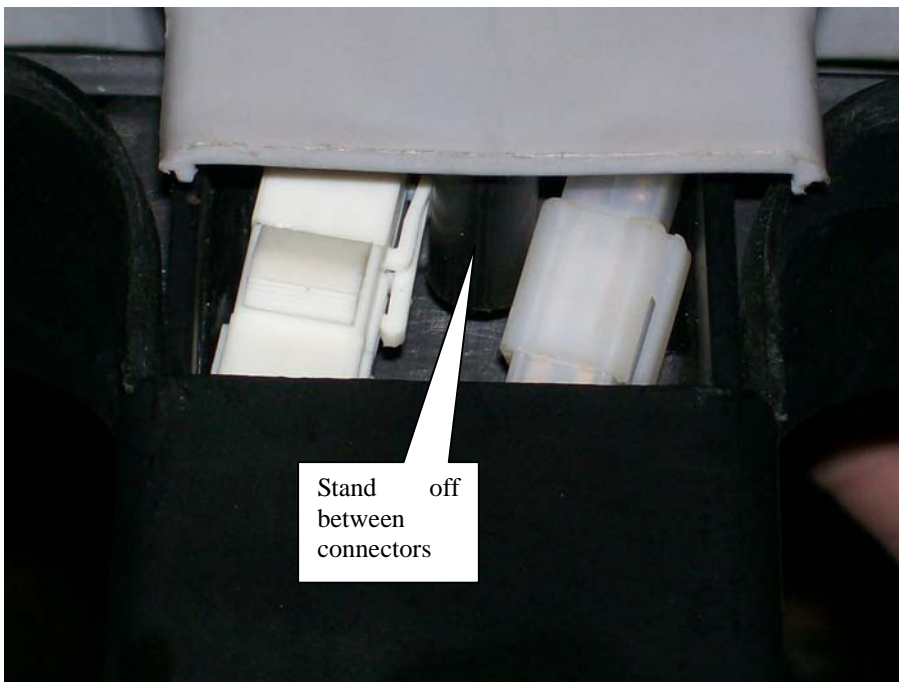


Fig.28

Gently push the tiller throttle assembly in place. Again, it's just reversing steps 3 through 7 to get the tiller throttle assembly back on the handle. Re-install the 3 Allen screws, verify no switches are sticking, and that the thumb wheel moves freely. Turn the unit on and verify operation. This completes the assembly.

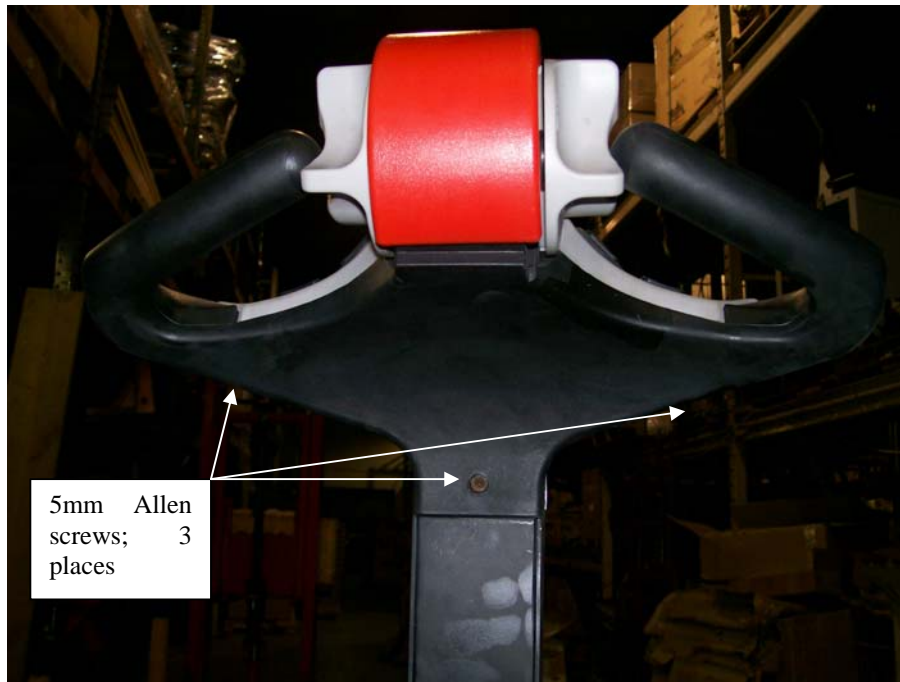


Fig.29

Free Wheeling E-CART

If for reasons of convenience, you require to push your E-CART for a short distance, the drive system can be put into 'freewheels mode'. This will allow your E-CART to roll freely.

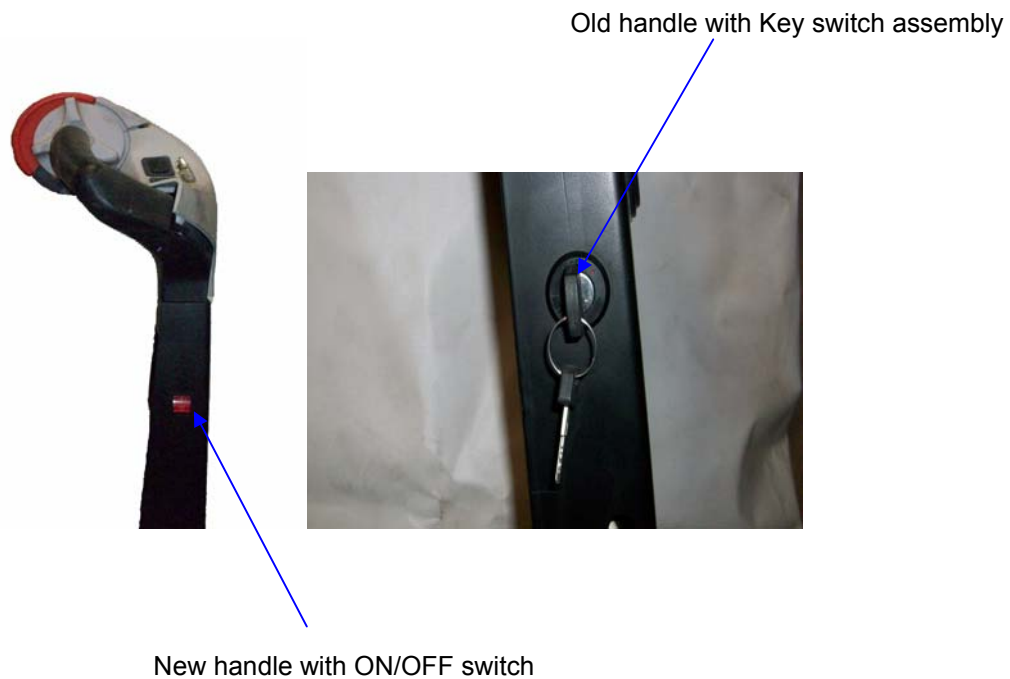
E-CART Freewheel Procedure

The freewheel device is a lever located at the front right hand side of your E-CART (Fig.1)



Fig.1

To freewheel E-CART first switch off the power switch located on control handle (Fig.2)



Push down the lever until a distinct click is felt (disengage) Fig.3.



Fig.3

Push and maneuver E-CART manually with ease.

To re-engage the drive system, simply pull backwards on the lever until a distinct click is felt (engage).



Turn the power switch "ON" on the control handle and you will be able to operate the E-CART once again.

Warning: Always check that the freewheel device is in the drive position before attempting to operate your E-CART after it has been left unattended for a period of time. Failure to observe this warning may result in an accident.

Maintenance and repair

(A) DAILY CHECK THE FOLLOWING:

- 1) Frayed wires
- 2) Damage or structural deformation to the structural members.
- 3) Unusual noise or binding, or evidence thereof.
- 4) Proper functioning of all limit switches, including those on the perimeter pinch point guard (if applicable)
- 5) Horn works
- 6) Battery, keep the surface of battery clean and dry. Make sure battery is secured against slipping. Make sure batteries are fully charged.
- 7) Tire condition.

(B) SIX MONTHS Check and adjust as necessary:

- 1) Tire wear, replace as necessary
- 2) All fasteners and fittings for sound function. Unusual noises or movement during operation
- 3) Tension of handle bar lock and hinge bolt
- 4) Battery connections
- 5) Inspect all electrical plugs and sockets for damage and good contact and fit. Proper water level in the battery
- 6) Proper functioning of any hand-or foot-operated mechanisms
- 7) All the information, safety, and wearing labels being in place and in good condition
- 8) The need to clean off dirt and debris

(C) ANNUALLY Check the following and adjust as necessary:

- 1) Tire bearings for wear
- 2) Handle bar bolts and nuts
- 3) Chassis for sounds
- 4) Drive wheel hub keys
- 5) All wheel bolts
- 6) Drive axle securing bolts
- 7) Motor mounting bolts
- 8) Magnetic motor brake disc and function
- 9) Main wiring harness for damage
- 10) Clean chassis and repaint any exposed parts
- 11) Lubricate ON/OFF power key barrel
- 12) Replace any damaged axle seals
- 13) Cycle test charger for full operation function
- 14) Cycle test batteries for operating capacity
- 15) Check motor brushes for any wear in the lift motor, & if necessary change motor brushes.
- 16) Check the condition of your tires regularly. Look for sign of wears, cuts and foreign objects lodged in the tread.

Note the items listed under weekly and six months should be incorporated into this annual inspection.

Use a general purpose light lubricating oil on moving parts.

All wheel bearings are factory sealed and should not normally need lubrication.

DRIVE TRANSMISSION LUBRICATION

This unit is factory filled and will not normally need additional lubrication.

Note: E-CART transmission is filled with a special lubricant. Don't attempt to force grease into the transmission as this will contaminate the original lubrication and will invalidate your warranty.

Serial No. _____

Model: _____

LIMITED WARRANTY

Vestil Manufacturing Corporation (Vestil) warrants E-CART model Traction-Drive Carts, to be free of defects in material and workmanship during the warranty period. Our warranty obligation is to provide a replacement for a defective original part (a part that used to make the product as shipped to the warrantee) after we receive a proper request for warranty service. "Proper request" means that we must receive: 1) a photocopy of the Customer Invoice from Vestil (or authorized distributor) that displays the shipping date; AND 2) a written request for warranty service. Send requests by any of the following methods:

Mail

Vestil Manufacturing Corporation
2999 North Wayne Street, PO Box 507
Angola, IN 46703

Fax

(260) 665-1339

Email

sales@vestil.com

In the written request, list the parts you believe are defective and include the address where replacements should be delivered. After Vestil receives your request, an authorized representative will contact you to determine whether your claim is covered by the warranty (also see "What will Vestil do to correct defects" below). Before providing warranty service, Vestil may require you to send the entire product or the defective part or parts to its facility in Angola, IN.

Who may request service?

Only the warrantee may request service. *You are a warrantee if* you purchased the product from Vestil or from an authorized distributor AND the product is fully paid for.

What is covered under the warranty?

The warranty covers the following *original* drive components: drive motors, electronic controllers, and switches. It also covers *original* parts that wear under normal usage conditions ("wearing parts"): bearings, wheels, seals, motor brushes, batteries, and the battery charger. The warranty period for drive and lift components is 1 year. For wearing parts, the warranty period is 90 days. Both warranty periods begin on the date when Vestil ships the product to the warrantee. If you purchased the product from an authorized distributor, the periods begin when the distributor ships the product, which extends the warranty by up to an additional 30 days.

If a defective part is covered by the warranty, what will Vestil do to correct the problem?

Vestil will provide an appropriate replacement for any *covered* part. An authorized representative of Vestil will contact you to discuss your claim and to arrange warranty service.

What is not covered by the warranty?

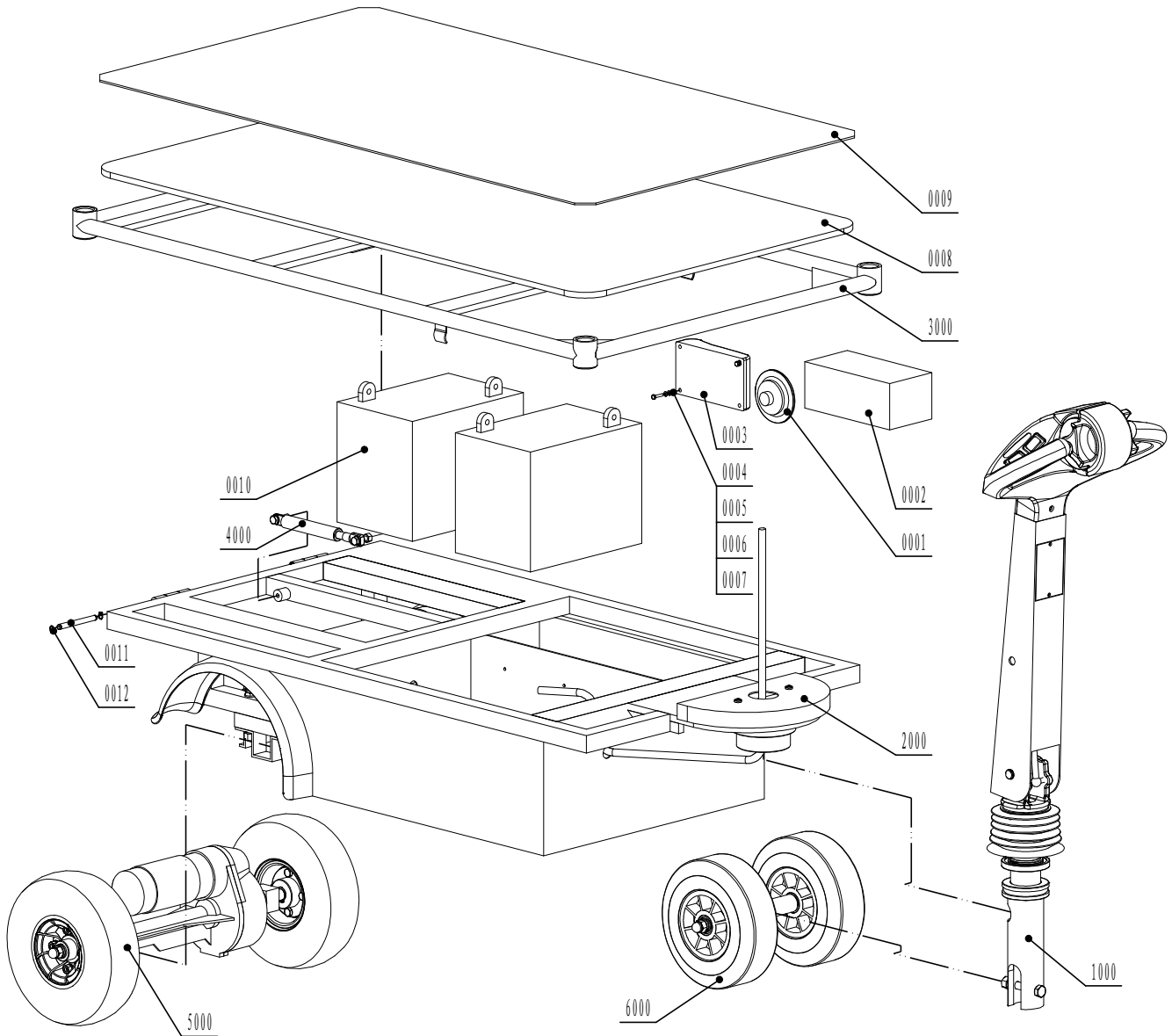
1. Labor costs;
2. Any of the following automatically void the warranty:
 - Product misuse;
 - Negligent operation or repair;
 - Corrosion or use in corrosive conditions;
 - Inadequate or improper maintenance;
 - Failure to exercise good judgment;
 - Damage sustained during shipping;
 - Accidents involving the product;
 - Unauthorized modifications: Do NOT modify the product IN ANY WAY without first receiving written authorization from Vestil. Modifications may render the pallet truck or stacker unsafe to use or might cause excessive and/or abnormal wear.

Do any other warranties apply to the ladder stand?

Vestil Manufacturing Corp. makes no other express warranties. Any warranty implied-by-law is limited in duration to the warranty period.

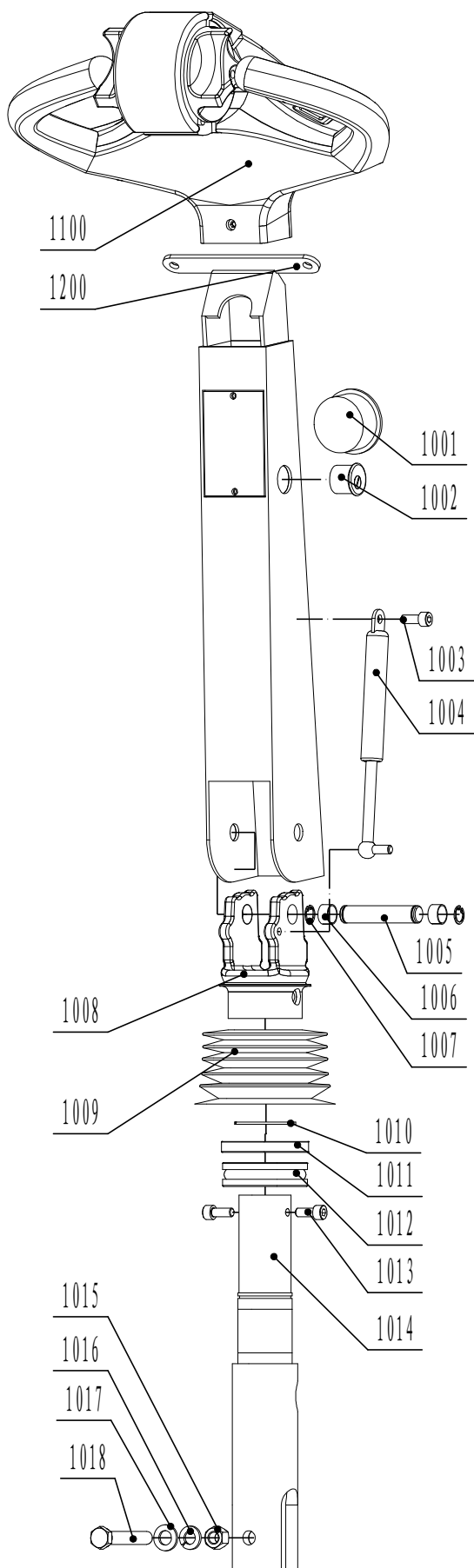


E-CART-1



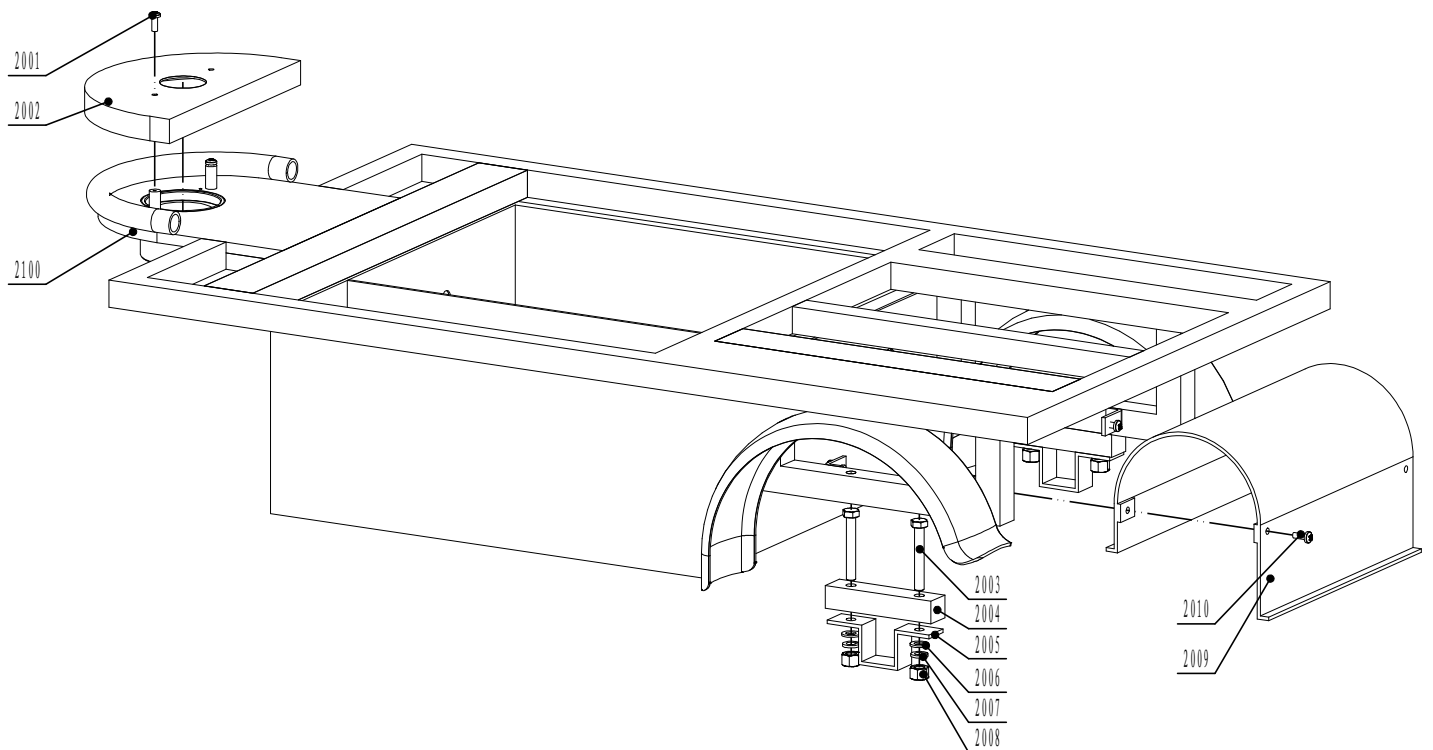
NO.	Code	Name	QTY	NO.	Code	Name	NO.
1000	ET-35-010000	Turning system	1	0004	GB/T6170-1986	Hexagon nut M4	2
2000	ET-35-040000	Main Frame	1	0005	GB/T96-1985	Plain washer 4	2
3000	ET-35-020000	Rack	1	0006	GB/T96-1985	Plain washer 4	2
4000	ET-35-080000	Air spring	1	0007	GB/T5783-1986	Hex head screw	2
5000	ET-35-060000	Back wheel	1	0008	ET-35-000002	Rack	1
6000	ET-35-070000	Front wheel	1	0009	ET-35-000001	Cushion	1
0001	DC24V	Horn	1	0010	12V/70Ah	Battery	2
0002	AC110/60Hz/24V/10A	Battery charger	1	0011	ET-35-000005	Pin	2
0003	curtis1228-2430	Electric controller	1	0012	GB/T894.1-1986	Snap ring 8	4

ET-35 Turing system



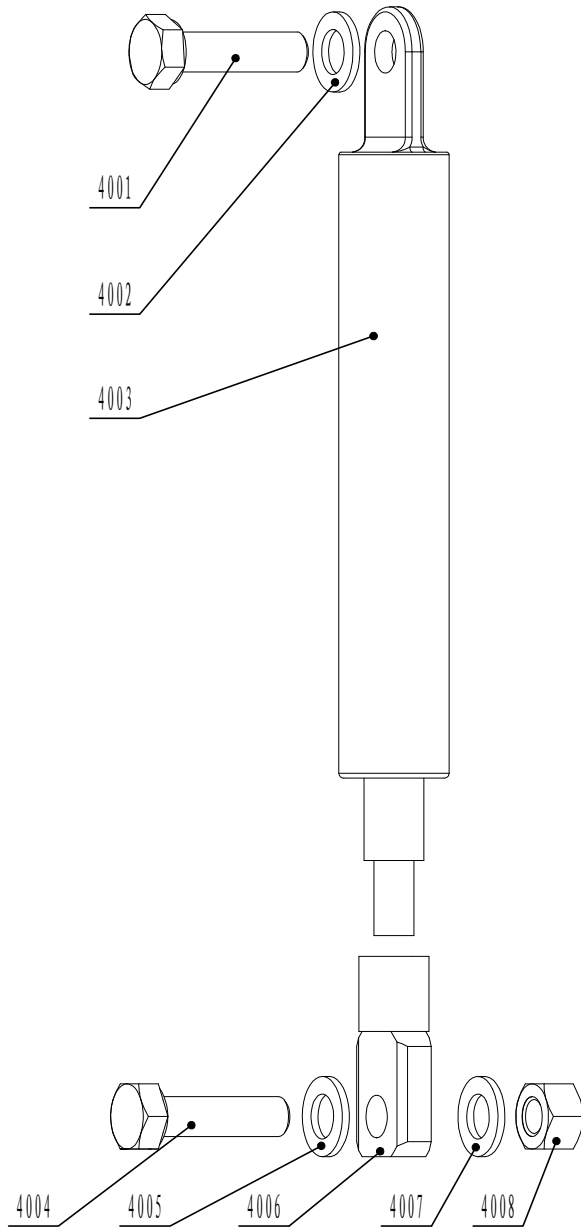
NO.	Code	Name	QTY
1100	PWS-100/25-3100	Control head (CH-2)	1
1200	ET-35-011000	Handle Bar	1
1001		Battery meter	1
1002		Swith	1
1003	GB/T70.3-2000	hex socket cap screw	1
1004	PWS-100/25-3001	Air spring	1
1005	PWS-100/25-3002	Set bearing	1
1006	[Z] SF-1 1610	Brush	2
1007	GB/T894.1-1986	Snap ring 16	2
1008	PWS-100/25-3004	Handle board	1
1009	WPS-100/25-3004	Rubber seal	1
1010	GB/T894.1-1986	Snap ring 50	1
1011	GB/Y276-1994	Ball bearing	1
1012	GB/T301-1995	Bearing 51210	1
1013	GB/T70.3-2000	Hex socket screw	2
1014	ET-35-010001	Directional axle	1
1015	GB/T41-2000	Hex nut M12	1
1016	GB/T93-2002	Snap ring 12	1
1017	GB/T95-2002	Plain washer 12	1
1018	GB/T5783-1986	Hex head screw	1

E-CART



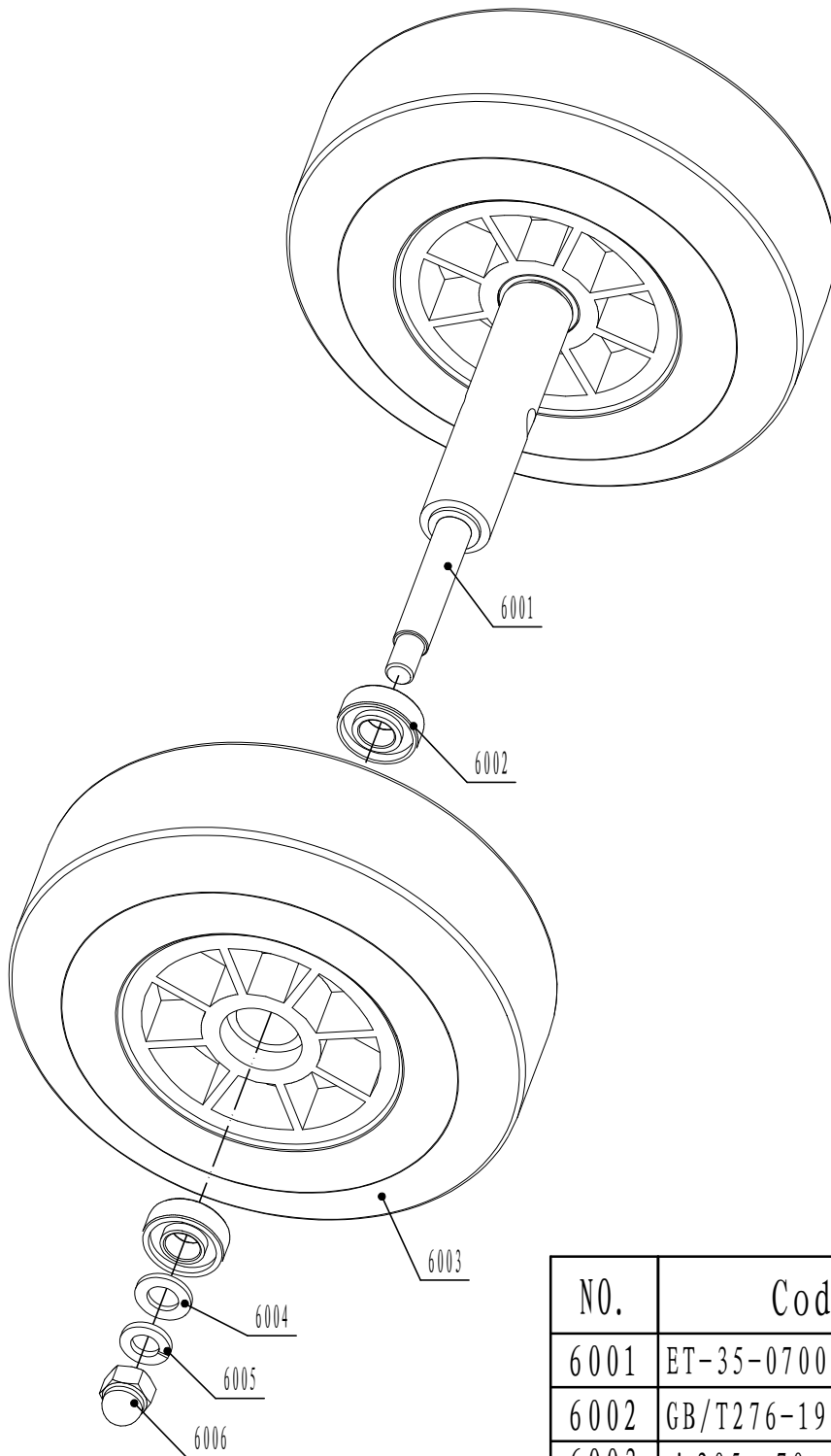
NO.	Code	Name	QTY
2100	ET-35-041000	Main Frame	1
2001	GB/T818-1985	Cross Bolt M5×10	2
2002	ET-35-040008	Board	1
2003	GB/T5783-1986	Hex Bolt M10×90	4
2004	ET-35-040006	Wheel Cushion	2
2005	ET-35-040005	Wheel bridge	2
2006	GB/T95-2002	Washer 10	4
2007	GB/T93-2002	Spring Wash 10	4
2008	GB/T41-2000	Hex Nut M10	4
2009	ET-35-040002	Wheel Cover	1
2010	GB/T67-2000	Bolt M6×12	4

ET-35 Air Spring



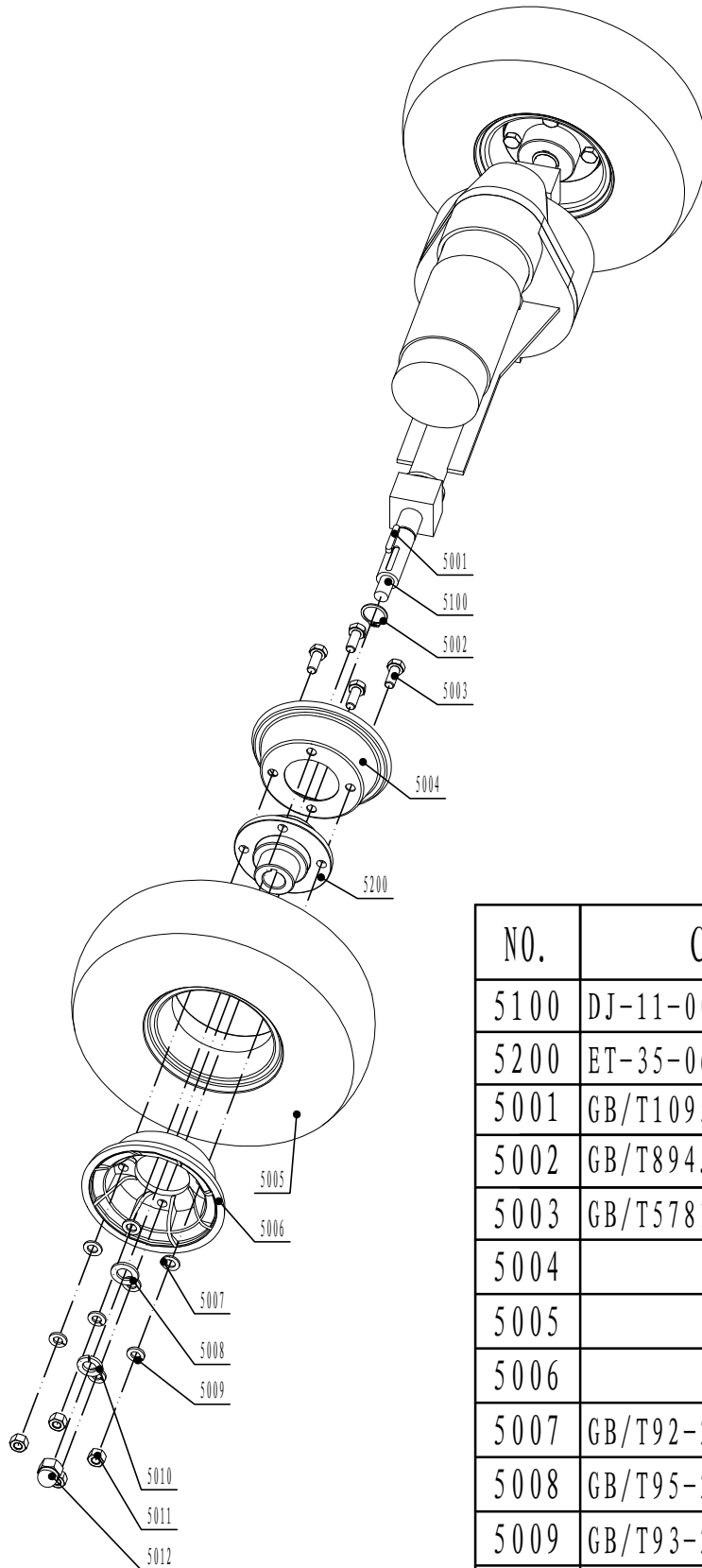
NO.	Code	Name	QTY
4001	GB/T5781-1986	Hexagon BoltM8×25	1
4002	GB/T95-2002	Plain Nut 8	1
4003	90N	Air Spring	1
4004	GB/T5781-1986	Hexagon BoltM8×25	1
4005	GB/T95-2002	Plain Washer 8	1
4006	ET-35-080001	Tie-in	1
4007	GB/T95-2002	Plain Washer 8	1
4008	GB/T41-2000	Hexagon Nut M8	1

ET-35 Front Wheel



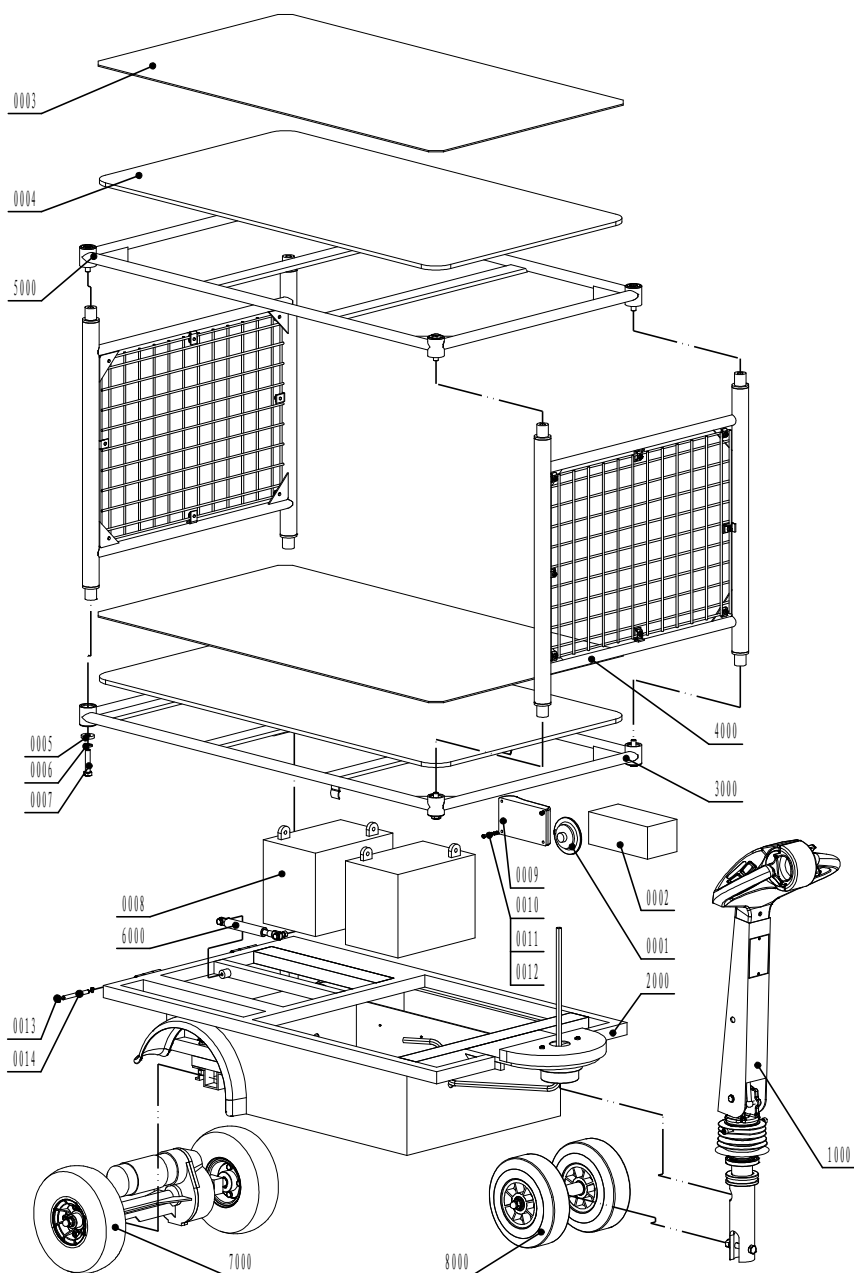
NO.	Code	Name	QTY
6001	ET-35-070001	Shaft	1
6002	GB/T276-1994	Ball Bearing 6003	4
6003	$\phi 205 \times 70$	Front Wheel	2
6004	GB/T95-2002	Plain Washer 12	2
6005	GB/T93-2002	Spring Washer 12	2
6006	GB/T923-1986	Hexagon Cap Nut	2

ET-35 Wheel



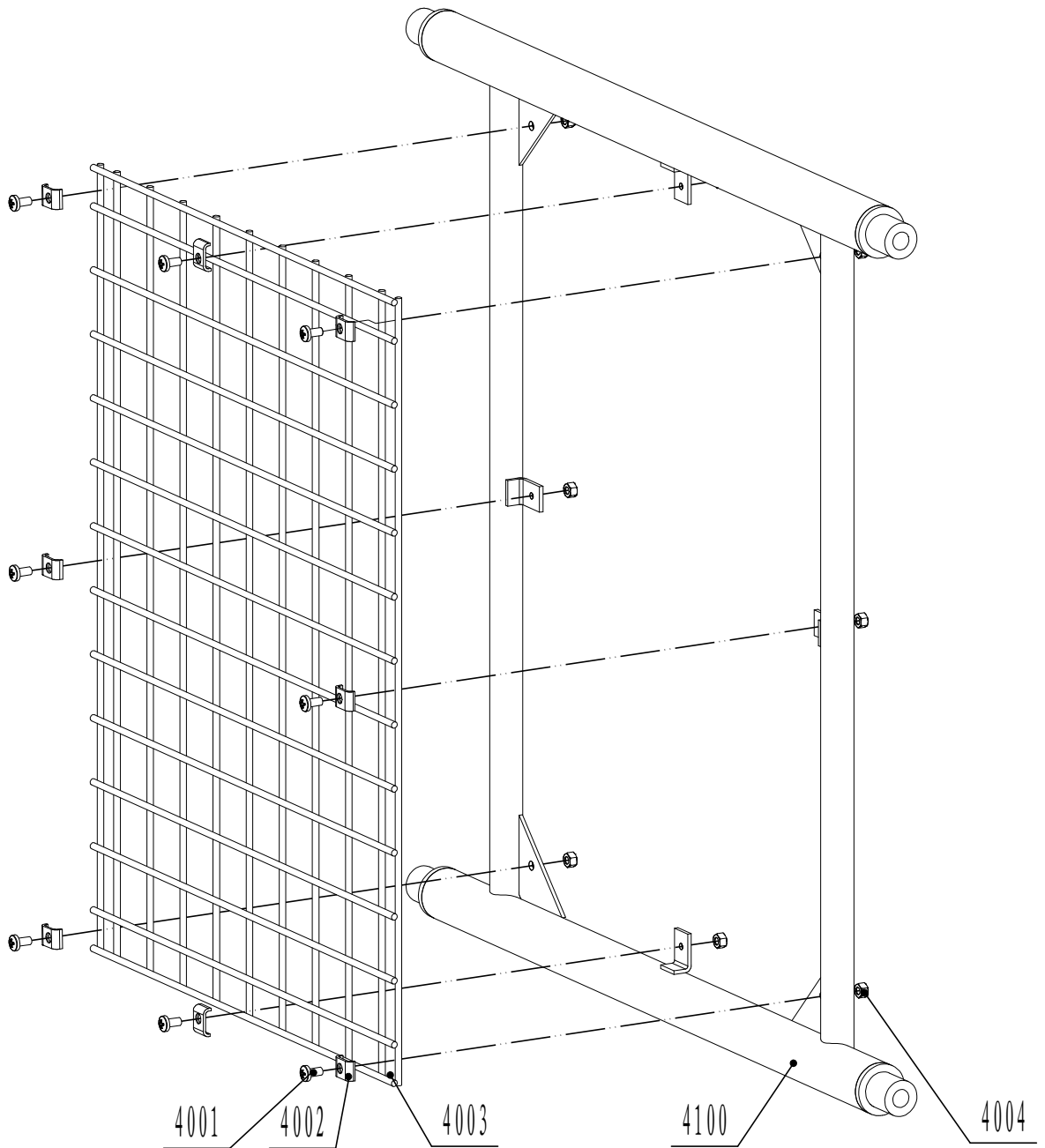
NO.	Code	Name	QTY
5100	DJ-11-00	Drive Shaft	1
5200	ET-35-061000	Flange	2
5001	GB/T1095-79	A Parallel key	2
5002	GB/T894.1-1986	Snap Ring 19	2
5003	GB/T5781-1986	Hex Bolt M8 × 30	8
5004		Inneer spoke	2
5005		Wheel	2
5006		Outter spoke	2
5007	GB/T92-2002	Washer 8	8
5008	GB/T95-2002	Washer 12	2
5009	GB/T93-2002	Spring Washer 8	8
5010	GB/T93-2002	Spring Washer 12	2
5011	GB/T41-2002	Hex Nut M8	8
5012	GB/T923-1988	Hex Nut M12	2

E-CART-2



NO.	Code	Name	QTY	NO.	Code	Name	QTY
1000	ET-35-010000	Turning system	1	0004	ET-35-000002	Board	2
2000	ET-35-040000	Main frame	1	0005	ET-35-000006	Washer	8
3000	ET-35-020000	Rack	1	0006	GB/T793-1987	Spring washer	8
4000	ET-35-050000	Meshwork	2	0007	GB/T5780-2000	Hex bolt M12×38	8
5000	ET-35-030000	Rack	1	0008	12V/70Ah	Battery charger	2
6000	ET-35-080000	Air spring	1	0009	1228-2430	Electric Controller	1
7000	ET-35-060000	Back wheel	1	0010	GB/T6170-1986	Hex bolt M4	2
8000	ET-35-070000	Front wheel	1	0011	GB/T96-1985	Plain washer 4	4
0001	DC24V	Horn	1	0012	GB/T5783-1986	hex head bolt M4×15	2
0002	AC110/60Hz/24V/10A	Battery charger	1	0013	ET-35-000005	Pin	2
0003	ET-35-000001	Cushion	2	0014	GB/T894.1-1986	Snap ring 8	4

E-CART Double Meshwork



NO.	Code	Name	QTY
4100	ET-35-050000	Frame	1
4001	GB/T818-1985	Cross panhead screw	8
4002	ET-35-050004	Point	8
4003	ET-35-050006	Meshwork	1
4004	GB/T41-2000	Hex nut M6	8

E-CART-WIRING

